diately perceptible. After stating the methods for adjusting this thermometer for the measurement of the greatest heights, the author details some experiments upon altitudes made with an instrument, 552 parts upon the scale of which were equal to 530 feet in altitude. With this instrument boiled on the counter of a bookseller's shop in Paternoster-row, estimated between four and five feet above the foot pavement on the north side of St. Paul's Churchyard, and boiled again in the gilt gallery of the cathedral, there was a difference of 254 parts; the corrected height thus indicated therefore = 272·64 feet. General Roy makes the gallery above the north pavement to be 281 feet, which, allowing five feet for the difference of station, brings the author's estimate to 267 feet, differing only four feet; or by another calculation, founded on General Roy's statement, the difference is less than two feet.

Observations on the Analogy which subsists between the Calculus of Functions and other branches of Analysis. By Charles Babbage, *Esq. M.A. F.R.S.* Read April 17, 1817. [*Phil. Trans.* 1817, *p.* 197.]

At the commencement of this paper the author states the advantages which may be derived from the employment of analogical reasoning in mathematics, and recommends it as a very useful guide to new discoveries: he then proceeds to point out the striking resemblance which subsists between several parts of common algebra and the integral calculus, and similar parts of the calculus of functions.

Mr. Babbage then notices certain fractions which, by peculiar relations among the functions of which they consist, become evanescent. The true values of these fractions are ascertained, and they are applied to the solution of a class of functional equations which the author had solved in a former paper, from which the following result is obtained:—" Whenever the mode of solution there adopted seems to fail, the failure is *apparent* only, and the general solution may always be deduced from it."

Several points of resemblance between the integral calculus and that of functions, are then noticed; and a remarkable analogy between a method of integrating differential equations, and a mode of solving functional equations, is pointed out; in both cases the operations are performed by multiplying by a factor, whose form is to be determined by another equation. Some equations are given in which this method is successful, and the obstacles to its general application are pointed out as demanding further inquiry.

Of the Construction of Logarithmic Tables. By Thomas Knight, *Esq. Communicated by* Taylor Combe, *Esq. Sec. R.S.* Read February 27, 1817. [*Phil. Trans.* 1817, *p.* 217.]

Two General Propositions in the Method of Differences. By Thomas Knight, *Esq. Communicated by* Taylor Combe, *Esq. Sec. R.S.* Read February 27, 1817. [*Phil. Trans.* 1817, *p.* 234.]

Note respecting the Demonstration of the Binomial Theorem inserted in the last Volume of the Philosophical Transactions. By Thomas Knight, *Esq. Communicated by* Taylor Combe, *Esq. Sec. R.S.* Read April 17, 1817. [*Phil. Trans.* 1817, *p.* 245.]

In this note the author expresses his regret at finding that the demonstration of the binomial theorem, and the first proposition of his paper on the construction of logarithms, formerly presented to the Royal Society, had been previously given by Mr. Spence in his Essay on Logarithmic Transcendents. This author, however, says Mr. Knight, is not particularly happy in the manner of developing the kind of functions treated of in his preface, and therefore in the present note gives a solution of a class of equations of which Mr. Spence has considered a particular case, without however resolving.

On the Passage of the Ovum from the Ovarium to the Uterus in Women. By Sir Everard Home, *Bart. V.P.R.S.* Read May 1, 1817. [*Phil. Trans.* 1817, *p.* 252.]

No physiological subject has attracted more attention than the first formation of the embryo in the class Mammalia; and although it has been ascertained that an ovum is formed in the ovarium of the quadruped, the circumstances respecting its impregnation have not been ascertained. Harvey, and John and William Hunter, have each failed in this inquiry; Haighton and Cruikshank were equally unsuccessful. In this state of our knowledge, says Sir Everard Home, accident has led to that which no predetermined experiments could have accomplished, and has enabled me to detect the ovum in the human uterus. It is so small, that had not the uterus been previously hardened in spirit, it would probably have escaped observation; and, says the author, it would have been difficultly identified as the ovum from which a child was to be produced, had it not been for the assistance of Mr. Bauer, the only person who could so correctly apply the powers of the microscope as to enable him accurately to delineate its organization.

The history of the case and dissection is as follows.

A servant maid, twenty-one years of age, left her master's house the 7th of January, 1817, for several hours in the forenoon. On returning in the evening she complained of sickness, and went to bed. Next day she continued unwell. The period of menstruation had arrived, but did not come on. She appeared much distressed in her mind. On the 13th she had an epileptic fit, became delirious, and died on the 15th. On examining the uterus it showed signs of pregnancy; and circumstances proved that she must have been impregnated on the 7th of January, that is eight days before her death.